REMARKS/ARGUMENTS

Claims 1 – 4, 12 – 24, 26 – 29, 31 and 32 stand rejected under 35 USC 103(a) as being unpatentable over Ward et al. (U.S. Patent No. 4,736,390) (hereinafter Ward) in view of Tilley et al. (U.S. Patent No. 6,225,848) (hereinafter Tilley). Claim 25 stands rejected under 35 USC 103(a) as being unpatentable over Ward in view of Tilley and further in view of Bartusiak. Claims 5-11 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of base claim and any intervening claims. Applicants respectfully traverse these rejections and submit that the claims presently on file distinguish over these references, but nonetheless have amended the claims to clarify their scope and to expedite the issuance of the patent. Applicants note that the Examiner did not indicate whether the drawings filed on July 27, 2002 were accepted or objected to.

Ward describes a down-conversion topology which combines pseudo-random encoding with a standard zero-IF topology. Ward explains at lines 8 – 12 of column 1: "Zero IF type receivers are well known in the prior art and essentially a zero IF type receiver skips the step of going to an IF frequency and instead converts the desired incoming signal directly to baseband in a single operation." In other words, a zero-IF topology uses a single mixer, and down-converts the incoming signal to baseband (for example) with a single mixing signal at the carrier frequency of the received signal. Ward modifies this system by spreading the single mixing signal with a pseudo-random signal, and then at a second mixer, de-spreading the output from the first mixer using the same pseudo-random signal. But a single mixing signal is being used to perform the down-conversion. The pseudo-random signal is being used for a different purpose.

As pointed out by the Examiner, "Ward does not teach this technique is applied to an up-converter", as recited, in part, in claim 1, "A radio frequency (RF) up-convertor..." Claim 1 further distinguishes from Ward for at least the following reasons. Ward fails to describe a complementary pair of mixing signals which "emulate" a direct-conversion mixing signal, but rather, uses a direct-conversion topology and a single mixing signal, and have laid known spreading and de-spreading over it. As best understood, because in Ward the spreading and de-

spreading are done with identical signals, any leakage from the local oscillator to the input of the first mixer would simply be spread and then de-spread again by the second mixer. Hence, Ward fails to reduce the effect of LO leakage at the input to the first mixer.

Furthermore, it appears that Ward reduces the effect of LO leakage at the input to the second mixer, because any leakage at this point would be spread at the output of the second mixer. However, the second mixer only exists because Ward has added the second mixer to the zero-IF topology. Consequently, Ward does nothing to reduce LO leakage at the first mixer, and adds a second mixer that apparently does not have a major LO leakage problem. The second mixer adds to the size of the circuit, consumes power, and adds noise to the input signal. Therefore, it is not clear how the addition of this second mixer and the pseudo noise signals in Ward would do anything to improve overall performance.

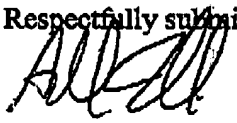
Turning now to the Tilley patent, Applicants submit that Tilley is quite remote from the claimed invention. As the Examiner has pointed out, Tilley describes a direct conversion or zero-IF receiver in which a feedback loop is used to control DC offsets. Only a single mixing signal is used, and its frequency does not vary over time. Applicants submit that Tilley has nothing to do with the two-mixer direct-conversion emulation of the invention, and in fact, teaches away from the invention in that it proposes a completely different approach to addressing LO leakage and DC offsets. Applicants therefore submits that Tilley does not address the shortcomings of the Ward. Furthermore, there would be no motivation for the person skilled in the art to locate these references to address the problems of the invention, let alone to combine them as alleged by the Examiner. Applicants therefore submit that claim 1 is patentable over Ward, taken alone, or in combination with Tilley.

Claim 1 is also amended to recite, in part, "emulating....", "time-domain analysis", which neither Ward, nor Tilley, disclose. Claim 1 and its dependent claims 2-29 are thus allowable over Ward in view of Tilley for at least the reasons cited above. Claims 31 and 32 are allowable for at least the same reasons as is claim 1.

Claims 25 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ward and Tilley in view of Bartusiak (US Patent No. 6,016,422). The Examiner asserts that it would have been obvious to combine the teaching of Bartusiak of a local oscillator running at twice the frequency of the desired mixing signal, with the teachings of Ward and Tilley to arrive at the invention of claim 25. Applicants respectfully disagree. Bartusiak fails to address the shortcomings of the Ward and Tilley, as described above. Furthermore, Applicants submit that there is no motivation to combine Ward, Tilley and Bartusiak, each of which is directed at different mixing signals, to arrive at the invention of claim 25.

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400

Respectfully submitted,



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